BEFORE THE

Federal Communications Commission

WASHINGTON, D.C.

In the Matter of	)	
	)	
Amendment of Parts 2 and 25 of the Commission's	)	
Rules to Permit Operation of NGSO FSS Systems	)	ET Docket No. 98-206;
Co-Frequency with GSO and Terrestrial Systems	)	RM-9147
in the Ku-Band Frequency Range and	)	RM-9245
	)	
Amendment of the Commission's Rules to Authorize	)	
Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band	)	
by Direct Broadcast Satellite Licensees and Their	)	
Affiliates	)	

REPLY COMMENTS OF LORAL SPACE & COMMUNICATIONS LTD.

Loral Space & Communications Ltd., by its attorneys, submits its reply comments in the above-referenced proceeding.[1]

I. INTRODUCTION.

Loral supports the Commission's efforts to develop rules which will promote sharing between NGSO and GSO systems. But Loral and other commenters urge the Commission to defer adoption of specific technical rules, such as NGSO epfd and apfd limits, until the ongoing work of the International Telecommunication Union Radiocommunications Sector ("ITU-R") study groups is complete.[2] Loral supports and is participating in the study group process and

---

1 Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range and Amendment of the Commission's Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates, ET Docket No. 98-206, RM-9147, RM-9245, *Notice of Proposed Rulemaking*, FCC 98-310 (rel. Nov. 24, 1998)("NPRM").

2 See, e.g., PanAmSat Comment at 2; Satellite Coalition Comments at 5.

believes it will lead to a set of power limits that will allow co-existence between NGSO and GSO systems.[3]

Since the 1997 World Radiocommunication Conference ("WRC-97"), Joint Task Group 4-9-11 and Working Party 4A have made significant progress toward developing a new set of epfd and $epfd_{up}$ limits that will be considered at WRC-2000. But the work of the study groups is ongoing and there are many critical issues yet to be resolved.[4] The Commission should carefully consider the final conclusions of the study groups before adopting specific technical rules on NGSO FSS/GSO FSS sharing. The Commission should, however, expeditiously process the first round NGSO system licenses and adopt non-technical rules, such as service rules, for which a complete record will be developed in this proceeding.[5]

Loral provides reply comments below on four issues: (1) interference into large GSO earth stations; (2) protection of inclined orbit GSO satellites; (3) protection of GSO satellites during TT&C operation of NGSO systems; and (4) the Commission's proposal to permit domestic GSO FSS gateway operations in the 10.7-11.7 GHz and 12.75-13.25 GHz bands.

---

3 Loral Comments at 3; GE Americom Comments at 8 ("Technical analysis of NGSO/GSO sharing will continue over the next several months. In a sense, then, this rulemaking is premature."); Telesat Canada Comments at 6.

4 For example, analysis is still being performed in the study groups to derive the appropriate single-entry limits, taking into account the effects of multiple NGSO systems, to be considered at WRC-2000. Loral believes that any protection limits developed must take into account the effects of multiple NGSO systems. See Loral Comments at 15; see also GE Americom Comments at 8; PanAmSat Comments at 2 ("[T]he WRC-97 limits are 'single entry' limits that ignore the probability that multiple NGSO FSS systems will be launched and placed into operation."). Such limits must afford sufficient protection to the GSOs without undue burden on the NGSOs. See SkyBridge Comments at 36.

5 See SkyBridge Comments at 118.

II. LARGE GSO EARTH STATIONS SHOULD BE ACCORDED PROTECTION FROM NGSO INTERFERENCE IN A MANNER THAT MINIMIZES THE NUMBER OF INSTANCES IN WHICH COORDINATION IS REQUIRED.

There is widespread agreement that both GSO and NGSO operators should work together to minimize the number of instances where specific coordination of individual large earth stations becomes necessary.[6] Coordination is an expensive and time-consuming process. Accordingly, the ITU study groups are working to derive epfd limits that will eliminate or minimize the need for individual coordination.

Loral agrees with SkyBridge that the Commission should not address this issue until the study groups complete their analysis of the results of ongoing studies of potential interference into large earth stations.[7] ITU study groups have very recently collected data on the geographic distribution of large earth station antennas around the world. Proponents of Commission action on this issue have focused on isolated large earth stations, which would be subject to the maximum NGSO interference.[8] A more reasonable approach would be to undertake statistical analysis of the recently collected data, to take into account the geographical variation of the epfd as well as the geographical distribution of the large earth stations. Such an analysis would better enable the study groups to make recommendations to minimize hardship to NGSO systems and contemporaneously afford protection to the maximum number of large earth stations.

---

6 See, e.g., Loral Comments at 5; Boeing Comments at 22-23; PanAmSat Comments at 22-23; GE Americom Comments at 22; SkyBridge Comments at 50-51.

7 SkyBridge Comments at 49.

8 GE Americom Comments at 22; Telesat Canada Comments at 7.

Loral also agrees with the comments filed by Boeing and Sullivan Telecommunications Association ("STA") that antenna diameter or antenna gain is not the only criterion that should be considered in the studies and analysis of this issue.[9] Other factors, such as the intended applications, the performance objectives for the applications, and typical margins, should also be factored into an objective evaluation of the problem.

III. GSO SATELLITES IN SLIGHTLY INCLINED ORBIT SHOULD REMAIN COMMERCIALLY VIABLE DESPITE INTERFERENCE FROM NGSO SYSTEMS; HOWEVER SETTING A SPECIFIC INCLINATION THRESHOLD WOULD BE PREMATURE.

There is general agreement that the commercial viability of GSO satellites in slightly inclined orbits should not be jeopardized by NGSO FSS systems.[10] However, contrary to some of the comments,[11] Loral believes that it is premature to set any specific inclination protection thresholds until the magnitude of any potential adverse effects by NGSOs on slightly-inclined GSO operations is well understood.[12]

In evaluating the impact of NGSOs on slightly inclined GSO operation, the types of services that are typically provided by GSOs in slightly inclined orbits should be considered. Of particular importance is the availability percentages that are set for these GSO services.

---

9 See Boeing Comments at 23; STA Comments at 7.

10 See, e.g., Boeing Comments at 25; GE Americom Comments at 23; PanAmSat Comments at 18.

11 See Boeing Comments at 25 (NGSO FSS systems should be required to meet epfd limits for GSO satellite inclinations up to 5°.); GE Americom Comments at 23 (same); Telesat Canada Comments at 7 (Protection should be afforded for inclinations of at least 5° and preferably 6°.).

12 See SkyBridge Comments at 53.

Results presented at the January, 1999 JTG 4-9-11 meeting indicated that GSO receivers do not experience any significant increase in epfd working with satellites with absolute inclinations of up to 3° and that epfd might increase 3dB for satellites with 5° of inclination.[13] In light of these results, Loral suggested that protection for satellites with up to 4° of inclination would be a reasonable goal. However, the US4A18R4 study currently subject to National Committee review, prior to acceptance and submission to the WP4A meeting in Geneva, provides significant new results.[14] This study adjusts the NGSO satellite beam gain and the GSO receive earth station pattern to be more in line with actual proposed systems. The resulting cumulative epfd values from an NGSO system are lower than what was computed in the earlier study when GSO arc exclusion mitigation techniques were used. The US4A18R4 study shows that the epfd levels experienced by a 0.7 meter GSO antenna operating with a slightly inclined GSO satellite are virtually the same for inclinations from 0° - 4° for 99.99% of the time or less. The study does not provide any results for larger GSO receive antennas at Ku-Band. However, extrapolating from a similar analysis at 19 GHz included in the study, it seems likely that the results for a 3-meter Ku-Band antenna would be similar to that of the 0.7-meter antenna.

The US4A18R4 study also shows that for applications requiring higher than 99.99% availability, there is a significant relationship between experienced epfd and the inclination of slightly inclined GSO satellites. The epfd experienced by the GSO earth stations rises with increasing inclination (for inclinations beyond 2.5°). For an availability of 99.999%, the epfd experienced by a 0.7-meter GSO receive antenna for a 4° inclination is 8.2 dB higher than that for

---

13 Loral Comments at 6.

14 The study is in part a refinement of an earlier study (JTG 4-9-11/282).

a 2.5° inclination. The US4A18R4 study also shows that in the case of NGSOs which do not use GSO arc exclusion mitigation, the epfd experienced by a GSO antenna working with a slightly inclined GSO satellite is independent of the inclination of the GSO. In other words, this form of mitigation by the NGSO affects non-inclined and slightly inclined GSOs equally. In this case the epfd levels are higher than in the case of GSO arc exclusion forms of mitigation.

This study and others like it must be scrutinized further by the study groups before the Commission will have a complete record on these issues. However, the initial results indicate that slightly inclined GSO operations up to a reasonable inclination (4°) may not be adversely affected by the currently proposed NGSO systems. These results underscore the fact that it would be premature for the Commission to set a specific inclination threshold; indeed, the most recent study suggests that a separate threshold may not even be necessary to protect GSO operations up to 4° of inclination.

IV. CONSULTATION BETWEEN OPERATORS AND THE EPFD AND $EPFD_{up}$ LIMITS UNDER CONSIDERATION WILL ADEQUATELY PROTECT GSO TT&C OPERATIONS; NO ADDITIONAL MEASURES ARE NEEDED.

Loral agrees with the Commission that the impact of NGSO interference during GSO transfer orbit operations will be infrequent and of short duration.[15] There is significant support for the proposal that the affected GSO and NGSO licensees should consult with one another to ensure successful deployment of the GSO spacecraft.[16] Some commenters also agreed that the epfd and $epfd_{up}$ limits that will be adopted at WRC-2000 for the protection of normal

---

15 See NPRM at ¶ 29.

16 See Boeing Comments at 27; GE Americom Comments at 23; SkyBridge Comments at 54-55; Telesat Canada Comments at 7; Telesat Canada Reply Comments at 5.

communications over GSO satellites will adequately protect normal TT&C operations of such satellites.[17]

There is agreement that during an emergency, the telecommand carriers of the GSO and NGSO systems should be permitted to operate at higher power levels.[18] It has not been shown that the NGSOs will cause unacceptable interference into normal GSO TT&C operations or create an unmanageable situation during an in-orbit GSO satellite emergency. Therefore, there seems to be no basis to suggest that NGSOs should avoid using GSO TT&C frequency slots for communications.[19]

V. THE COMMISSION SHOULD PERMIT DOMESTIC GSO FSS GATEWAY OPERATIONS IN THE 10.7-11.7 GHz AND 12.75-13.25 GHz BANDS.

In its initial Comments, Loral supported the Commission's proposal to amend footnote NG104 of the Table of Frequency Allocations to permit domestic GSO FSS gateway operations in the 10.7-11.7 GHz and 12.75-13.25 GHz bands.[20] This proposal was supported by several other commenters.[21] For example, PanAmSat noted that "[t]he Commission should not place

---

17 Boeing Comments at 28 (stating that the epfd limits under development by JTG 4-9-11 will be adequate to protect GSO FSS TT&C operations); Loral Comments at 7; SkyBridge Comments at 54; but see Telesat Canada Reply Comments at 5 (stating that further study is needed to establish TT&C procedures).

18 As noted in Loral's comments, the off-axis EIRP of the GSO telecommand carriers should be allowed to exceed the limits contained in Art. S22 by up to X dB. Loral Comments at 7. The study groups will seek to determine the value of X based on further analysis.

19 See PanAmSat Comments at 25-26

20 Loral Comments at 4 and 8.

21 See Satellite Coalition Comments at 6-7 (stating that its members "uniformly believe that the Commission should not give NGSO FSS access to the NG104 bands for domestic communications without giving comparable access to GSO FSS systems"); see also PanAmSat Comments at 19; GE Americom Comments at 25; Telesat Canada Comments at 7. Boeing stated that it had no objection to permitting GSO FSS gateway operations in

NGSO systems in a preferred position by giving them -- but not GSO systems -- access to the 10.7-11.7 GHz and 12.75-13.25 GHz bands for domestic purposes."[22] GE Americom made a similar point, noting that "[t]here is no reason why GSO FSS providers should be locked out of the 12.75-13.25 GHz and 10.7-11.7 GHz bands in this new competitive environment."[23] Loral supports the reasoning of these commenters because it is well-established that the Commission may not treat similarly situated parties differently.[24]

In the initial comment round, only the Fixed Wireless Communications Coalition ("FWCC") opposed the Commission's proposal,[25] observing that continuing to limit GSO FSS stations to international operations in these bands would be "an additional measure to help restrict the total number of earth stations in the band."[26] But such an additional measure is not needed to protect fixed service operators. Rather, as SkyBridge has shown, gateway definition and coordination procedures can fully protect fixed service operators.[27]

---

the 10.7-11.7 GHz band, but that the Commission should retain the international-only service designation for GSO FSS service links. Boeing Comments at 83-84.

22 PanAmSat Comments at 19.

23 GE Americom Comments at 25.

24 See McElroy Elec. Corp. v. FCC, 990 F.2d 1351, 1365 (D.C. Cir. 1993).

25 In the reply round, Airtouch also opposed this proposal. See Airtouch Reply Comments at 8.

26 FWCC Comments at 7.

27 SkyBridge Comments at 67.

VI. CONCLUSION.

Loral requests that the Commission adopt rules consistent with these Comments.

Respectfully submitted,

LORAL SPACE & COMMUNICATIONS LTD.

By: Sophie J. Keefer

Stephen R. Bell
Jennifer D. McCarthy
Sophie J. Keefer
WILLKIE FARR & GALLAGHER
Three Lafayette Centre
1155 21st Street, N.W.
Washington, D.C. 20036-3384
Tel. (202) 328-8000

Its Attorneys

April 14, 1999

ENGINEERING CERTIFICATION

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in these reply comments of Loral Space & Communications Ltd., in the NPRM ET Docket No. 98-206, that I have either prepared or reviewed the engineering information upon which they are based and that they are complete and accurate to the best of my knowledge.

Dated the 14th day of April 1999

By: _____
Sundaram C. Moorthy
Director, Spectrum Development
Loral Skynet®[1]

[1] Skynet is a registered trademark of Loral SpaceCom Corporation.